

Bureau of Mining Regulation and Reclamation

MONITORING AND ANALYSIS OF POST-CLOSURE HEAP DISCHARGE

3 June, 1996

Purpose: The Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (the Bureau) recognizes that for some closed, no longer active mining facility process components, it is likely that solution discharge may continue for some indeterminate period of time following Bureau approval of stabilization. Any post-closure solution discharge must be appropriately managed. This must consist of at least one or more of the following: conveyance to a containment structure/facility for treatment and/or dispersal; monitoring of flow rate and volume; and sampling for analysis of solution quality.

Post-closure treatment and monitoring activities must remain in accordance with State regulation(s) relevant to stabilization as defined by the Nevada Administrative Code (NAC) 445A.430 such that waters of the State will not be degraded. The degree to which these activities are pursued for a post-closure solution discharge will be a function of the (a) final compliance sampling of heap effluent/rinsate (WAD cyanide and pH) and heap solids (Meteoric Water Mobility Procedure - MWMP, Profile I or II) constituent concentrations, (b) attenuation characteristics of soils proposed to receive discharged (land applied) solution, (c) Bureau approval for achieving stabilization and subsequent closure of mine waste components, and (d) the measures proposed and/or deemed necessary to eliminate the potential for this discharged solution to degrade waters of the State. These necessary measures could significantly reduce and minimize any long-term liability of the property owner/operator regarding potential, future degradation. It must therefore be demonstrated over time that post-closure stabilization has been and will continue to be achieved. The installation of a post-closure fluid management system (FMS) could achieve this goal.

Information must be presented that clearly demonstrates that under the conditions that exist at the site any future, post-closure solution discharge from any source resulting from residual drain-down and/or meteoric event will not degrade waters of the State. This site specific information should include geologic and hydrogeologic conditions, average annual precipitation and evaporation, depth to groundwater and distance to surface water, and soil attenuation characteristics.

A proposal should therefore be submitted to the Bureau that provides the specific design and construction details for a post-closure containment and "treatment and/or dispersal" system.

Consider the following:

1. When installed, the FMS should allow for:
 - a. Monitoring the discharged solution flow rate and volume;
 - b. Solution sampling prior to and following its containment;
 - c. Passive (e.g., bioremediation) solution treatment, if applicable; and
 - d. Solution dispersal.
2. The FMS configuration (see figure 1) should consist of at least the following components:
 - a. A collection tank that ties directly into the existing solution collection lines or channels from the process component (heap) discharge point;
 - b. Two collection "sumps" which can be accessed as monitoring and sampling ports, both up- and down-gradient of and in-line with the collection tank, to (i) measure inflow and outflow rates, and (ii) collect solution samples for subsequent analysis;
 - c. The collection tank, as applicable for passive treatment, should be filled with a media capable of attenuating potentially contaminating constituents from the discharged solution; and
 - d. A manifold-like outflow port for conveying solution to and eventual dispersal through a conventional leach-field (septic) system located some distance down-gradient from the FMS collection/treatment tank and installed below the existing surface grade.
3. A monitoring program should be proposed and implemented for a period of at least five (5) years following Bureau approval for stabilization and closure of respective process components at the site. Unless analytical results or site conditions suggest otherwise, monitoring and sampling of this FMS should be done on a quarterly basis for at least two (2) years and semi-annually for the following three (3) years. Samples of discharged solution should be collected and analyzed for constituents listed on NDEP Form 0190. The need for additional monitoring beyond the initial two years will be based on a review of these quarterly data. Following an evaluation of the data, a request for a reduction in or modification to the monitoring program (i.e., monitoring and sampling frequency, analytical parameters) will be considered by the Bureau relevant to whether stabilization, as defined by (at least) NAC

445A.430, has been demonstrated.

4. A semi-annual report should be prepared to document the previous two quarters of monitoring data along with a summary description of monitoring activities, status of revegetation success, and related stability or sedimentation concerns for the property in and around the area of solution dispersal. Whenever possible, monitoring data should be presented as cumulative in a graphical format.

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(amended to update NAC statues and reword)

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